DATA SHEET

BYD67
Ripple blocking diode

Product specification
Supersedes data of 2003 Mar 14

2004 Jun 16

Philips
Semiconductors

PHILIPS

Ripple blocking diode BYD67

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier package.

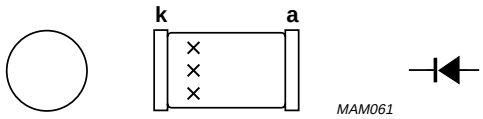


Fig.1 Simplified outline (SOD87) and symbol.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™(1) technology.

The SOD87 is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BYD67	–	hermetically sealed glass surface mounted package; Implotec™ technology; 2 connectors	SOD87

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	300	V
V_R	continuous reverse voltage		–	300	V
$I_{F(AV)}$	average forward current	T_{tp} = 85 °C; see Fig.2; averaged over any 20 ms period; see also Fig.4	–	1.2	A
		T_{amb} = 60 °C; PCB mounting (see Fig.8); see Fig.3; averaged over any 20 ms period; see also Fig.4	–	0.4	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C	–	11	A
		T_{amb} = 60 °C	–	3.7	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; T_j = 25 °C prior to surge; $V_R = V_{RRMmax}$	–	5	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; T_j = $T_{j(max)}$; see Fig.5	–	–	1.7	V
		I_F = 1 A; see Fig.5	–	–	2.3	V
I_R	reverse current	V_R = V_{RRMmax}; see Fig.6	–	–	1	μA
		V_R = V_{RRMmax}; T_j = 165 °C; see Fig.6	–	–	100	μA
t_{fr}	forward recovery time	when switched to I_F = 1 A in 50 ns; see Fig.9	–	–	350	ns
t_{on}	turn-on time	when switched from V_F = 0 V to V_F = 3 V; measured between 10 % and 90 % of I_{Fmax}; see Fig.10	500	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.11	–	–	150	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.7	–	17	–	pF

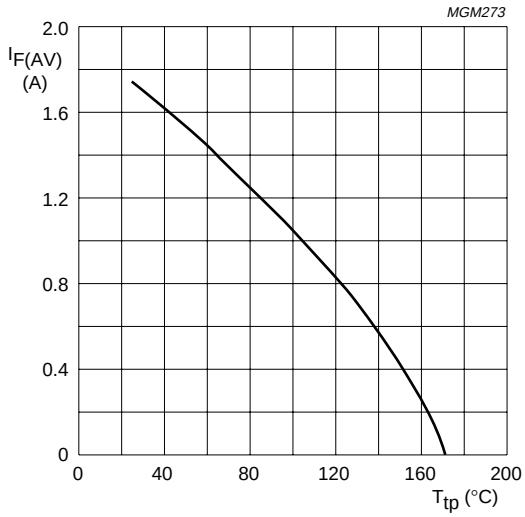
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-tp)}$	thermal resistance from junction to tie-point		30	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

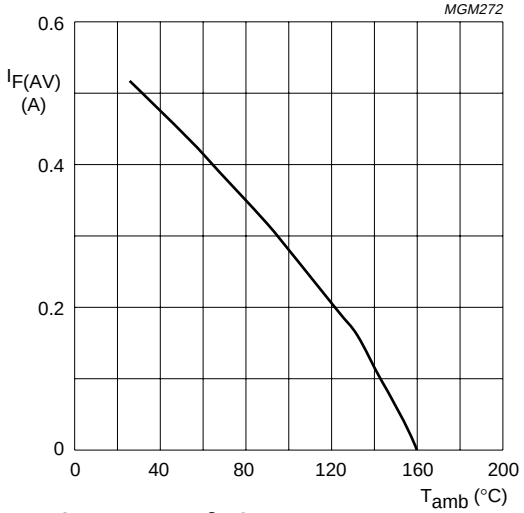
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.8. For more information please refer to the *'General Part of associated Handbook.*

GRAPHICAL DATA



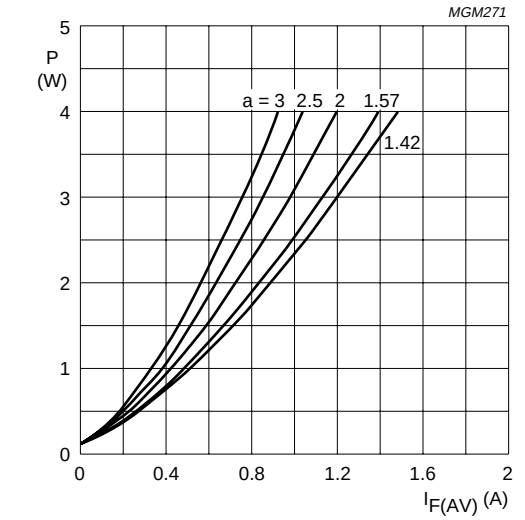
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



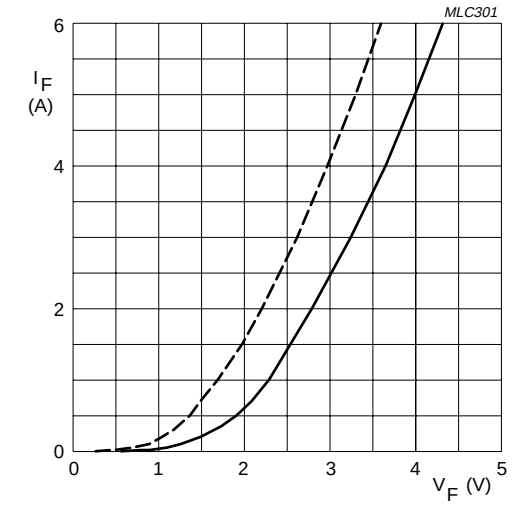
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in 4.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



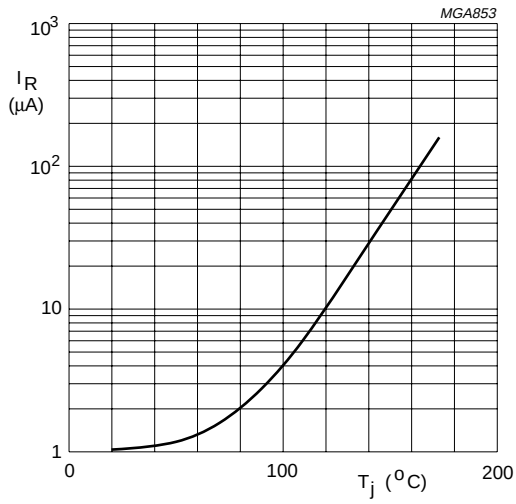
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



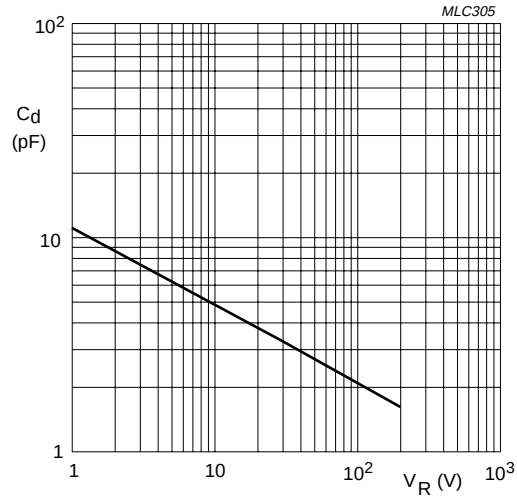
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.



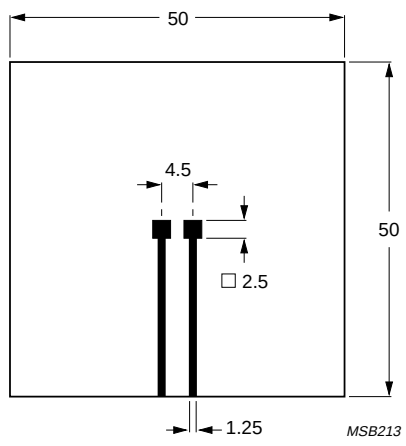
$V_R = V_{RRMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.7 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.8 Printed-circuit board for surface mounting.

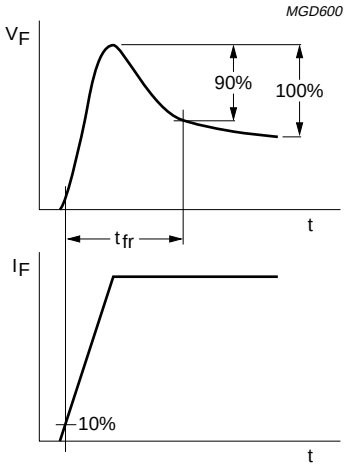
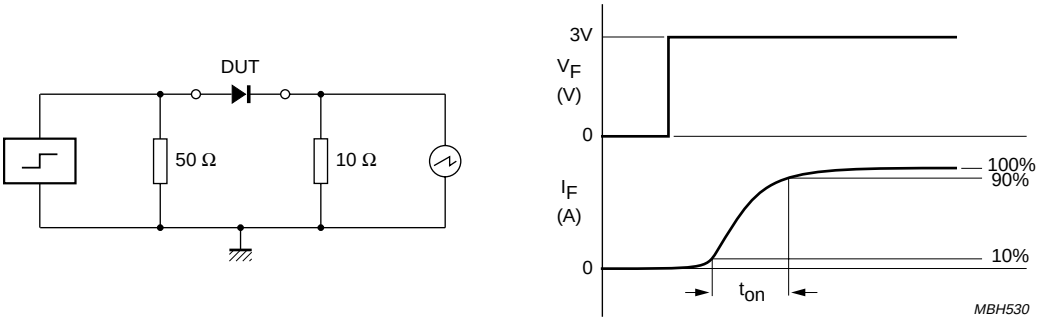
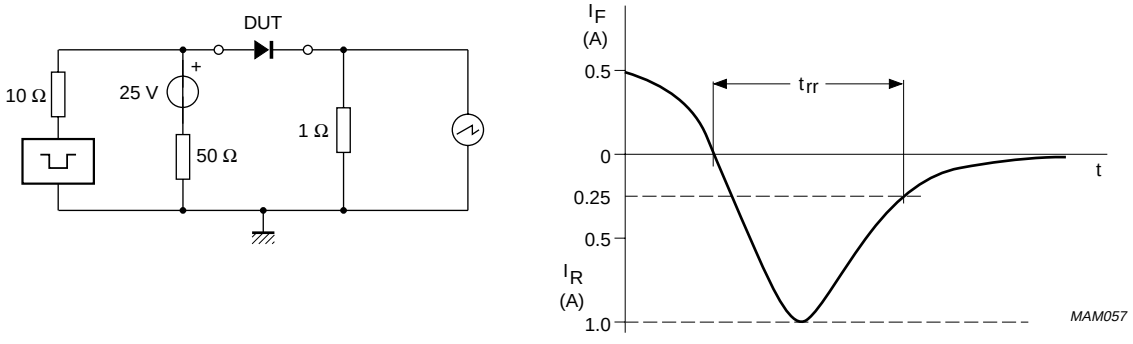


Fig.9 Forward recovery time definition.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 10$ ns.

Fig.10 Test circuit and turn-on time waveform and definition.

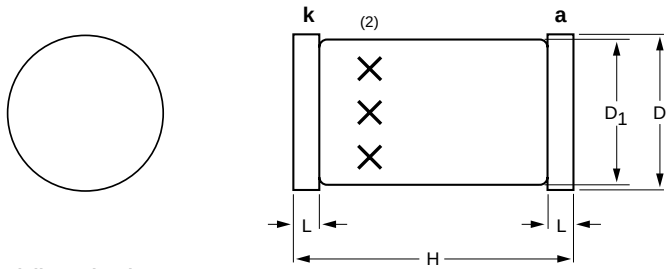


Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.11 Test circuit and reverse recovery time waveform and definition.

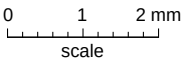
PACKAGE OUTLINE

Hermetically sealed glass surface mounted package; Implotec™(1) technology; 2 connectors **SOD87**



DIMENSIONS (mm are the original dimensions)

UNIT	D	D1	H	L
mm	2.1 2.0	2.0 1.8	3.7 3.3	0.3



Notes

1. Implotec is a trademark of Philips.
2. The marking indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD87	100H03					~~99-03-31~~ 99-06-04

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status ‘Production’), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit **http://www.semiconductors.philips.com**. Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

Printed in The Netherlands R72/04/pp9 Date of release: 2004 Jun 16 Document order number: 9397 750 13373

Let's make things better.

Philips
Semiconductors

PHILIPS